

NATIONAL AIR INTELLIGENCE CENTER



CONFERENCE REPORTS

by

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CONFERENCE REPORTS

I. All-China Academic Applications Conference of Ultrasonic Electronic Devices in Electronic Countermeasures, Radar and Military Communication Technology, Anhui

by Chen Dongpei

To intensify academic interdisciplinarity of ultrasonic electronics and military electronics, and to promote the development of these two disciplines, the Ultrasonic Electronics Branch Society of the China Acoustics Society, and the Electronics Countermeasure Branch Society of the China Electronics Society convened on Huangshan Mountain in Anhui Province an All-China Applications Conference of Ultrasonic Electronics Devices in Electronic Countermeasures, Radar and Military Communication Technology on October 15 to 19, 1990. The participants totalled more than 80 professors, specialists, experts, and Party leading cadres related to the field from eight universities and professional advanced institutions, 18 research academies and four enterprise consortiums. The editorial departments of two journals, YINGYONG SHENGXUE [APPLIED ACOUSTICS] and DIANZI DUIKONG [ELECTRONICS COUNTERMEASURES], also sent editorial personnel to cover the newsworthy events.

A total of 66 papers was received by the conference with contents relating to surface acoustic wave devices, high-

frequency acoustic wave devices, acousto-optical devices, applications of devices in radar, applications of devices in electronic countermeasures, and applications of devices in military communication systems, a total of six aspects. The occasion revealed the fact that great progress was gained in research on ultrasonic electronic equipment in China in recent years. In addition to further development and upgrading of the product varieties and of quality, breakthrough progress was obtained in systems applications. This indicates the importance of ultrasonic electronic technology in defense modernization activities.

The conference delegates held the view that the academic atmosphere is high-spirited with enthusiastic discussion. Specialists on equipment and systems had a better understanding and cooperation; the conference served the function of mutual inspiration and opening of broad views. The delegates held the view that the joint conference of device associations and systems associations is a beneficial activity of interdisciplinarity and mutual promotion of allied disciplines. They proposed that these joint conferences become regularly scheduled.

The conference published a volume of the collected papers of the Applications Academic Conference on Ultrasonic Electronics Equipment in Applications of Electronic Countermeasures, Radar and Military Communication Techniques.

II. Ultrasonic Processing and Ultrasonic Welding Academic Conference, Wuxi

Ma Yulong of the Secretarial Division, Power Ultrasonics Society

Jointly sponsored for the first time by the Power Ultrasonics Society and the Beam Current Ultrasonic Specialty Committee of the Electric Processing Society, the Academic Conference on Ultrasonic Processing and Ultrasonic Welding was

held in Wuxi, Jiangsu Province, October 17 to 19, 1990.

From 27 units of scientific research, advanced institutions and factories throughout China, 45 delegates publicly read 28 papers at the conference, including 13 papers on ultrasonic processing, six papers on ultrasonic welding, and nine papers on ultrasonic power source and transducers. Professor Ying Chongfu, honorary president of the Acoustics Society, attended the conference and spoke from the podium. At the conference, the delegates had adequate and enthusiastic discussions on all papers delivered at the conference. They generally concluded that the conference made great gains. This is an excellent and successful conference jointly held by the various societies.

With the gains made in science and technology, many departments proposed some new, special requirements in machining, thus promoting the development of ultrasonic machining, vibrational cutting and composite machining. In recent years, some of China's domestic advanced institutions have vigorously developed work in this area, thus achieving great progress. At present, the urgent demands are on steady, reliable and mature ultrasonic equipment for use by the related work units in order to upgrade research on technical applications and to promote broader applications..

Due to unique favorable properties unrivalled by other methods, at present applications and developments are still underway for metal welding in ultrasonic welding technology. However, the developments are rapid in the area of ultrasonic welding; there are supplies of these products available in China. Internationally, there has been a newer-generation high-grade ultrasonic plastic welding machine available commercially. We should further upgrade the technical performance of this kind of equipment and stress the applications research of this technology in order to match the world-level standards..

As to ultrasonic power sources and transducers, research on multiple aspects has been developed at a fast pace in recent years on phase-locked loop, automatic tracking, and automatic power adjustment for ultrasonic power sources. At present, ultrasonic washing and transistor application in power source of ultrasonic welding are in service. In addition, conventional, reliable and highly efficient transistor power sources have been developed. Further improvements will come in order to commercialize these developments.

With respect to the performance of piezoelectric ceramics, some products are at the international level of similar products on the international scene. Later on, new transducer materials with better features should be developed.

To encourage the publication of more and higher-quality research papers, this conference made an evaluation and selection of high-quality papers. All papers that were circulated in the conference will be issued paper certificates for encouragement.

III. Limited Ultrasonic Diagnosis Symposium on Blood Vessels in Neck, Brain and Extremities, Nanjing
by Zhang Aihong and Feng Ruo

Jointly sponsored by the Biomedicine Ultrasonic Engineering Branch Association of the China Acoustics Society, and the Bioengineering Medicine Department of Dongnan University, with vigorous support by the Biomedicine Research and Development Joint Corporation in Jiangsu Province, a limited Ultrasonic Diagnosis Symposium on Blood Vessels in the Neck, Brain and Extremities was convened at Nanjing, September 11-12, 1990. From Beijing, Shanghai, Xi'an and Nanjing (among other cities), more than 30 professors and specialists involved with vascular ultrasonic diagnosis attended the symposium as delegates.

The symposium mainly stressed reports with academic papers and summation of clinical experiences with academic exchanges of test procedures involving vascular diseases of the neck, cranial interior and lower extremities by using dual-power ultrasonic diagnosis instruments and colored Doppler blood-flow diagrams. The academic exchanges included the determination of arterial lumen and bloodflow parameters in the neck, spinal column and lower extremities, testing with dual-power ultrasonic diagnosis instrument, two-dimensional graphic display and Doppler bloodflow determination for cerebral thrombosis, ultrasonic inspection on the main arteries and on arteries in the neck, two-dimensional and colored Doppler inspection on the relationship between neck tumors and bloodflow, colored Doppler technical inspection on lower extremity arterial disorders of diabetes patients, as well as bloodflow variations in lower extremity arteries, and thrombosis of deep veins in the lower extremities for patients with extruded vertebral disk.

The symposium also invited anatomy specialists from Nanjing Medical College to lecture as applied to blood vessels inside and outside the cranium. Also invited were clinical specialists from the Nanjing Military Region general hospital and the Nanjing Mental Hospital. The symposium sufficiently displayed an atmosphere of combining the fundamental clinical and ultrasonic inspection so that the academic discussions reached a deeper level.

After one-and-half-day reporting, discussions, summation of experiences, more profound appreciation of advances, and questioning, the delegates in attendance gained a higher level of understanding on standardizing methods of examining neck blood vessels, types of plaque in neck arteries, as well as the infecting relationship with cerebral thrombosis. Moreover, some valuable opinions were advanced on the standard diagnostic problem of insufficient bloodflow to spinal column arteries.

This symposium was small in scale and short in duration. The discussion topics were concentrated with a high level of scientific exchange, enthusiastic discussion, and high effectiveness. This was a successful symposium. Delegates unanimously suggested that these limited symposia should be continuously organized and held; in addition, specialists from science and engineering should be invited to attend.

IV. Ultrasonic Machining and Ultrasonic Welding Symposium by Xu Kaixing

(1) A mathematical model of one-dimensional vibration on ultrasonic components (random subassemblies of ultrasonic transducers, amplitude-varying rods and tool heads) of stressed bolts was established by Yu Hongpei, Hangzhou Institute of Applied Acoustics of the Seventh Academy, in Yu's paper: "Design of Ultrasonic Components for Stressed Bolts." The model was explained by citing actual examples. A comparison with actual measurement results was made in verifying that this computational process is very flexible and convenient in designing ultrasonic engineering components, thus raising high interest among the symposium delegates. A night was set aside by the symposium for comrade Yu Hongpei to amplify in detail, with a demonstration of programming.

(2) As stressed by professor Lin Zhongmao, committee chairman of the Ultrasonics Branch Society, during summation of symposium activities: This symposium proceeded on a tight schedule but with very vigorous discussion and academic atmosphere. Applications of ultrasonics technology began in the late fifties. Developments were relatively slow for some time, but the pace picked up recently. Power ultrasonics curricula were set up at many advanced institutions. In the nineties, applications of ultrasonic welding and processing entered a

higher stage in China with good prospect. In the national economy, applications of ultrasonics technology are widespread with low equipment prices, as well as factual and good effective results. This is a technical realm with great developmental prospects in China. In addition, the symposium publicized the convening of International Acoustics Conference in China in 1992. Professor Lin encouraged specialists and technical personnel to work vigorously so that more high-quality papers and technical results can be available in technical exchanges at the international conference for the glory of China.

V. Acoustic Frequency Engineering Conference Held at Suzhou by Cui Guangzhong, and by the China Acoustics Society, the China Electronics Society and the Acoustic Frequency Engineering Association

The first annual conference and scientific exchange symposium of the China Electronics Society, the China Acoustics Society, and the Acoustic Frequency Engineering Association were held at Suzhou, November 19 to 22, 1990. Altogether, 38 delegates attended the conference; among them, there were 23 committee members of these societies and 15 invited delegates. The conference recapitulated the work accomplished since the engineering association was founded in 1989; personnel changes were made in the organizations. In addition, the principal work activities were studied for the immediate future. The conference told delegates on the situation and the related events at the Ninth Working Conference of the China Electronics Society. Altogether, 18 papers were received, including 17 that were delivered at the conference, with contents that included the following: Electro-acoustic Inspection Technique in Recent Years, Design of Sound Amplifying System, Evaluation of Tone Quality and Product Design. These papers are related to a wide range of aspects at a high academic level. Some papers are at a high theoretical level; through practice, certain social and economic

benefits will be realized. This is quite rare in recent years to be occurring in the field of acoustic frequencies. Through evaluation by the academic work committee of the conference, four high-quality papers were selected.

At the conference, preparations for the 1992 Fourteenth International Acoustics Conference to be convened in China were studied and discussed. The conference decided to convene a scientific symposium within the society to be held in the fall of next year so that papers can be recommended for presentation at the International Acoustics Conference. The China Acoustics Society is being notified of these projected activities; further arrangements will be made after further notification.

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